8. Traffic Impact Studies

(See Zoning Ordinance Section 78-501, Circulation and Traffic)

The Town of Herndon zoning ordinance User Guide series provides the public with general information on land use regulations affecting activities undertaken by the public and administered by the Herndon Department of Community Development. It is not intended to be a complete statement of all applicable regulations. Individuals are encouraged to contact the Department of Community Development at 703-787-7380 for complete permitting requirements.

What is a Traffic Impact Study?

The Traffic Impact Study is a technical report prepared by a trained professional to assess the impact likely to be created by a proposed development on roadway capacity and level-of-service. Preparation of a traffic impact study often involves a combination of field observation, computer analysis, report presentation, and discussion between the Town staff the person preparing the study.

Why Do We Need a Traffic Impact Study?

A Traffic Impact Study is used by the developer, staff and Town leaders to better manage traffic resulting from proposed development, understand ways to relieve traffic congestion in the streets, promote the safe operation of vehicles in public rights-of-way, coordinate the interface of public rights-of-way with private rights-of-way, and ensure the proper and uniform development of utilities, curb cuts and other features affecting streets. The Town zoning ordinance and other documents provide methods to ensure safe circulation and traffic control. The standards of Zoning Ordinance §78-501 apply to development in every zoning district.

When is a Traffic Study Required?

A Traffic Impact Study is required for Site Plan, Subdivision, Special Exception, or Official Zoning District Map Amendment applications for the following proposed developments:

- Residential proposals in excess of 20 dwelling units.
- Non-residential proposals in excess of 10,000 square feet of floor area.
- Any commercial drive-through service proposal.
- Uses other than residential single lot development with proposed direct vehicular access to Elden Street or Herndon Parkway.
- Any expansion of an existing use exceeding 5,000 square feet if no traffic impact study has been approved for the use in the five year period preceding the application for expansion.

What is the process for Submitting a Traffic Impact Study?

An applicant proposing a development that requires a traffic study should arrange a preliminary conference or meeting with the Community Development staff.

Subjects covered during the conference include

- scope of the study;
- data collection;
- trip generation, distribution and assignment assumptions and procedures;
- currently programmed or planned transportation improvements;
- critical points for the traffic;
- other approved developments nearby which should be considered in the traffic impact study;
- peak periods to be addressed in the study;
- the use of the current Highway Capacity Software (HCS) version or other software ; and
- any special considerations agreed upon to make the study more informative or appropriate with respect to the particular application.

Prior to conducting the study, the applicant should submit a letter to the Community Development staff to confirm the scope of the study, including the data to be collected and the assumptions to be used. The study must be prepared in accordance with the prescribed content for a traffic impact study as described below.

Once completed, the Traffic Impact Study is submitted along with all other materials to be reviewed for the development application. Zoning Ordinance §78-501 explains the Town's regulations for circulation and traffic. It provides standards for levels of service as well as circulation standards for vehicular movements and pedestrian movement.

Traffic Impact Studies must describe the extent, nature, and location of potential traffic impacts relevant to the proposed development. The study area will include the entire site, including future phases of a multi-phase development, and the surrounding roadways which are likely to be significantly impacted. At a minimum, the surrounding roadways to be included are:

- the expected routes of access to the site as far as and including the nearest major arterials serving the site from each direction nearest the site;
- the routes and associated freeway interchanges or major intersections expected to carry ten percent or more of the project's traffic; and
- other roadways expected to carry 1,000 additional daily vehicles or more as a result of the development, or 100 additional trips in the peak hour.

What Other Resources are Available?

Traffic engineers should also consult the Town's Public Facilities Manual which applies to developments under subdivision, zoning or general law authority in the Town. The Town's Public Facilities Manual is based on the 2001 Public Facilities Manual, Fairfax County, Virginia, as amended, and as may be amended from time to time, with necessary changes, except:

a. The requirement for sidewalks within the Fairfax County Public Facilities Manual is modified for Herndon so that sidewalks shall be required on both sides of new public streets, regardless of street width, projected traffic volumes, or type of subdivision.
b. The Fairfax County Public Facilities Manual is modified for Herndon the "Town of Herndon Public Facilities Manual Addendum, December 2004," on file in the office of the town clerk.
c. The Public Facilities Manual for Herndon incorporates by reference *Road and Bridge Specifications,* Virginia Department of Transportation, (January 1994), Vols. I and II, *Road and Bridge Standards,* Virginia Department of Transportation (1993), as amended, and as may be amended from time to time and Vols. I and II, *Road and Bridge Standards,* Virginia Department of Transportation (1996), as amended and may be amended.

Finally, the Institute of Transportation Engineers' publications Trip Generation and Transportation Impact Analysis for Site Development are recognized by the Town as appropriate guides for conducting a traffic impact study.

Traffic Impact Study Content

SECTION 1. SITE LOCATION AND STUDY AREA

A. Existing and Proposed Site Uses
B. Existing and Proposed Nearby Uses
C. Existing Roadways and Programmed Improvements

The traffic study must include a conceptual site plan for the overall project. The site plan should include the following information:

- Parcels included in the application, and other parcels in a multi-phase development;

- Location of the above parcels with respect to existing adjacent private and public roadways and driveways;
- Location of on-site parking and vehicular and pedestrian access to the site including interparcel connections; and
- Existing and proposed rights-of-way, roadway centerlines, driveways to public roadways which are part of overall project, including lane and/or pavement widths.

The site development proposal will include a narrative description of the phases of the project, the amount of land for each phase, the number of housing units, square footage, employment, and size and location of buildings and amount of parking for each phase (keyed to the site plan) and the expected date of occupancy for each phase.

If a multi-phase project, the site development proposal will include a general layout for the entire project. The level of analysis may be less detailed for future phases if approved in advance by the staff. In these cases, the staff may recommend that, as a condition of rezoning or permitting for subsequent phases, a complete site plan and a revised traffic study must be submitted and approved for each phase of the development before site plan approval.

SECTION 2. ANALYSIS OF EXISTING C0NDITIONS

A. Daily and Peak Hour(s) Traffic Volumes
B. Capacity Analysis at Critical Points
C. Levels of Service at Critical Points

The analysis of existing conditions will include a map of the overall project and the surrounding roadways. For each of these roadways, the inventory will identify:

- Existing travel lanes, lane widths, rights-of-way, and pavement conditions;
- Existing peak hour volumes and turning movement data collected within six (6) months prior to the application date;
- Levels of service for the peak hour period used in the assignment phases; and
- Existing problems or deficiencies, such as excessive horizontal and vertical curvature, inadequate sight distances, drainage, pavement markings or other deficiencies.

Turning movements for site entrances adjacent to or across the street from the subject project may be required, because the future project entrances may relate significantly to these existing entrances.

SECTION 3. ANALYSIS OF FUTURE CONDITIONS WITHOUT DEVEOPMENT

A. Daily and Peak Hour(s) Traffic Volumes
B. Capacity Analyses at Critical Points: the analysis can include any programmed improvements that will be in place by the future year
C. Levels of Service at Critical Points

The analysis of future conditions without development will include projections of daily and peak hour traffic on the study area road network for a point in time at which the proposed development is expected to be completed, but not less than two years or more than ten years into the future. Projections will be based upon or related to accepted traffic projections for the Town or region. Programmed improvements will include projects that appear in the Town's Capital Improvements Program, the Virginia Department of Transportation Six Year Plan, the

Northern Virginia Transportation Coordinating Council Regional Plan and/or the Constrained Long Range Transportation Plan of the Washington Metropolitan Areas. Future conditions will also include traffic generated by specific nearby developments, if information on these developments is provided by the Community Development Department.

SECTIION 4. SITE TRIP GENERATION

The traffic study will include trip generation data for each element or phase of the overall project. Trip generation data will include the total number of vehicles computed to be entering and exiting the site on an average weekday and during a.m. and p.m. peak hours. Trip generation rates will usually be based on the peak hour of adjacent roadways, and will be balanced and adjusted as described in Chapter IV of Trip Generation (ITE). The Town may require that a study for a restaurant include mid-day peak hour counts and trip generation.

Trip generation rates will be taken from the most recent edition of the ITE Trip Generation publication unless use of professionally documented local data (such as that provided from at least three similar developments in the Herndon area collected within the past five years) is approved in advance by the staff. Suitable documentation includes the type, location and size of each development, the dates and hours of data collection, the availability of public transportation, and the vacancy rate for the development. Copies of actual trip data may be required.

Vehicle trips will be computed by multiplying appropriate trip generation rates by the appropriate units for which the rates were intended. Mixed-use development trip generation modifications, pass-by trip percentages and project-related trip reduction strategies may be described and utilized to reduce trip generation. All such reductions will be accompanied by professionally prepared documentation and justification. The Town will review any proposed reductions in trip generation from a conservative point of view, because there is likely to be no room for making physical adjustments to the street system if proposed reductions do not materialize.

SECTION 5. SITE TRAFFIC DISTRIBUTION AND DIRECTIONAL SPLITS

The trip distribution process will estimate the directional distribution of travel to and from the site for the year of full occupancy. The trip distribution process may be accomplished by one of two means. The selected method must be identified in the Traffic Impact Study.

- Prepare a custom trip distribution based on the “area of influence” method described in the American Planning Association publication Traffic Impact Analysis by Greenberg and Hecimovich (PAS Advisory Service Report No. 387, 1984); or
- Prepare another acceptable distribution and assignment using data and procedures approved in advance by the Community Development Department.

SECTION 6. TRIP ASSIGNMENTS AND TURNING MOVEMENTS

The Traffic Impact Study will provide vehicle trip assignments for the peak hour period or periods which represent the worst case in terms of the sum of existing traffic and the traffic generated by the overall proposed development. Normally this will be the p.m. peak hour. If the trip generation for the a.m. peak hour exceeds 75 percent of the traffic generated by the p.m. peak hour, then both a.m. and p.m. peak hour trip assignments should be prepared.

These trip assignments will be prepared and illustrated for major internal roadways within the overall development, all site entrances, and for the surrounding roadways, intersections and

interchanges in the study area. Trip assignments will describe the peak hour directional vehicle volumes and turning movements at intersections and site entrances. Turning movement information for sites on the opposite side of the street from the project may be required, if necessary for adequate analysis of the proposed entrances for the project.

SECTION 7. ANALYSIS OF FUTURE CONDITIONS WITH DEVELOPMENT

A. Future Daily and Peak Hour(s) Traffic Volumes
B. Capacity Analysis at Critical Points: the analysis should include those additional improvements that will be proffered by the developer.
C. Levels of Service at Critical Points

This section will provide an analysis of the site's future traffic impact at full development in combination with future background traffic in the study area. The Traffic Impact Study will analyze the vehicle trip assignments with respect to:

- The adequacy of existing transportation facilities for future background plus site-generated traffic;
- The adequacy of existing facilities and planned transportation improvements for future background plus site-generated traffic.

This analysis will include a comparison of the appropriate peak hour levels of service for the intersections and other critical points on the surrounding roadways. Note: when the scope of the study requires a midday analysis, all references to AM and PM peak hours will also include Midday peak hour.

SECTION 8. RECOMMENDED IMPROVEMENTS

A. Proposed Recommended Improvements
B. Capacity Analyses at Critical Points (with improvements)
C. Levels of Service at Critical Points (with improvements)

The traffic study will provide a set of recommended transportation improvements and impact mitigation measures needed for the overall project and the surrounding roadways to function at minimum level of service upon full occupancy. When a multi-phase project is proposed, the improvements will be identified for each phase of the project so that the minimum level of service will be maintained throughout all development phases. The traffic study will identify recommended right-of-way dedications, additional roadway lanes and/or widths, geometrics and other improvements at principal driveways, entrances and intersections, and traffic control devices.

For multi-phase projects, assignments for later phases extending more than ten years in the future may have less detailed recommendations. At a minimum, specify the number of through-lanes required on access routes and major interior roadways, location of major intersections, site access points, and general criteria for spacing driveways and traffic signals.

In addition to roadway site entrance and intersection improvements, the Traffic Impact Study may identify other traffic mitigation measures to reduce peak hour trips. One example would be an aggressive carpool or vanpool program which includes a computer rideshare matching program and employer-sponsored incentives. "Flextime" programs can be used, especially for large single occupant buildings with a past history of staggered shift work hours. In each of these cases, the applicant will confer with the Community Development Department staff prior to

submitting the traffic study to discuss the specifics of such a proposal and to agree upon the extent of traffic reduction to be assumed.

SECTION 9. CONCLUSIONS

In this section, the applicant may draw general or specific conclusions with respect to the traffic impact of the proposed development.

LIST OF FIGURES REQUIRED IN TRAFFIC IMPACT STUDIES

	Title of Figure	Description
1	Site Location	A vicinity map showing the site and its surroundings
2	Existing and Planned Developments	A land use map showing existing and expected land uses that may affect the site. (May be combined with Figure #1)
3	Existing Transportation Network	A map showing existing roads that serve the site. Include all travel modes, traffic control devices, and moving lanes.
4	Existing Daily Traffic	A map showing the existing daily traffic on all roads shown in Figure #3 (May be combined with Figure #3).
5	Existing Peak Hour * Turning Movements	Current AM and PM peak hour traffic movements at all critical access points or intersections. (Note: Separate schematics for AM and PM).
6	Existing Peak Hour * Levels of Service	A map showing the existing levels of service for each lane group (through-left-right) on each approach at all existing intersections and on roadway sections that serve the proposed development site. This analysis is based on the traffic volumes displayed in Figure #5.
7	Future Average Daily Traffic (without the development)	This map displays the future average daily volumes for the non-site traffic. These traffic volumes (also called "background traffic" by many consultants) represent the future traffic without the proposed development.
8	Future Peak Hour Traffic (without the development)	This is also referred to as "background traffic". It is all of the traffic on the adjacent road network without the site development. It should be developed for AM and PM peak hours for the "build out" year.
9	Future Peak Hour * Levels of Service (without the development)	This figure displays the Levels of Service for each land group (through-left-right) on all approaches at all intersections (AM and PM) for the future year in which the development is expected to be "built out". The analysis should include any programmed improvements.
10	Directional Distribution of Site Traffic	Percent of traffic to and from the site by land use (AM and PM).
11	Total Site Traffic	AM and PM peak hour site traffic assigned to the adjacent road network. It includes turning movements at all access points. This should be developed for ultimate development and phases of development. It should also be developed in layers for each land use on the site. More than one figure may be required.
12	Total Average Daily Traffic Volumes (with the development)	(May be combined with Figure #13)
13	Total Peak Hour * Traffic Volumes (with the	This figure includes traffic from Figures #7 and #11 for AM and PM peak hours at ultimate ("build-out") development and / or phases of the development.

LIST OF FIGURES REQUIRED IN TRAFFIC IMPACT STUDIES		
	Title of Figure	**Description**
	development)	
14	Future Peak Hour * Level of Service (with the development) on the Existing Road Network	This figure displays the Level of Service for each land group (through-left-right) on all approaches of each intersection impacted by the development. This helps to identify any deficiencies that may occur if the new development traffic is added to the existing road system.
15	Future Peak Hour * Level of Service (with the development) and with Recommended Improvements	This figure displays the Level of Service for each lane group (through-left-right) on all approaches of each intersection impacted by the development. This analysis is based on traffic volumes from Figure #12 and should include the improvements that are required to provide an acceptable Level of Service with the new development in place.
16	Recommended Improvements	Map showing locations of recommended off-site improvements, access points, additional lanes, traffic signals and on-site circulation. A table and a description in the text of all recommended improvements should be provided. These improvements must alleviate any adverse conditions caused by the development. This may require special designs and large scale drawings.

Need more information?

Got a question on required permits, the permit process, or application requirements? Call or make an appointment to see a member of the staff in the **Department of Community Development at 703-787-7380.**

Have a question regarding building permits or construction codes? Call or make an appointment to see the **Building Official at 703-435-6850.**

Visit the Town of Herndon on the web at www.herndon-va.gov for the Zoning Ordinance User Guide series or to access the Town Code. Town offices are located at the Herndon Municipal Center at 777 Lynn Street, Herndon, Virginia, 20172.

User's Guide to the Zoning Ordinance Series

1. Neighborhood Meetings and Public Participation in the Planning and Zoning Process
2. Zoning Map Amendments
3. Signs
4. Special Exceptions
5. Site Plan Review Procedures
6. Single Lot Development
7. Chesapeake Bay Provisions
8. Traffic Impact Studies
9. Subdivision Site Plans
10. Unified Commercial Subdivisions
11. Performance Guarantees
12. Heritage Preservation Regulations
13. Board of Zoning Appeals
14. Conducting a Business in the Home
15. Fences
16. Accessory Structures
17. Summary of Permitted and Allowed Uses in the Zoning Districts
18. Summary of Dimensional Standards in the Zoning Districts
19. Commercial Vehicle Parking in Residential Districts
20. Parking on Lots with Single Family Detached Dwellings
21. Landscape and Buffer Requirements
22. Explanation of Variances, Waivers, Adjustments, and Exceptions
23. Fee Schedule
24. Temporary Use Permits, Special Events
25. Day Care, Child Care, Preschool and Home Day Care
26. Zoning Inspection and Zoning Appropriateness Permits

27. Written (Mailed) Notification to Adjacent Property Owners for Scheduled Public Hearings
28. Refuse Collection on Private Property
29. Exterior Lighting Standards
30. Vacating a Street Right-of-Way